

IN THE CLAIMS:

Please amend claims 1, 2, 6, 10, 11, 14, 17, 21 and 22 as follows:

1. (Twice Amended) A method of manufacturing a semiconductor device, comprising the steps of:

irradiating a non-single crystalline silicon film with laser light to crystallize the non-single crystalline silicon film; [and]

thermally annealing the [crystallized] non-single crystalline silicon film in the temperature range of 450-750°C in a nitrogen atmosphere to decrease a spin density in the crystallized silicon film; and

patterning the crystallized silicon film into an island after the thermally annealing step.

2. (Twice Amended) A method for producing a semiconductor device, comprising the steps of:

irradiating a non-single crystalline silicon film with laser light to crystallize the non-single crystalline silicon film; [and]

thermally annealing the [crystallized] non-single crystalline silicon film in the temperature range of 450-750°C in a non-oxidizing atmosphere to decrease dangling bonds in the crystallized silicon film; and

patterning the crystallized silicon film into an island after the thermally annealing step.

6. (Twice Amended) A method of manufacturing a semiconductor device, comprising the steps of:

selectively introducing a metal element for promoting crystallization of silicon into an amorphous silicon film by solution application;

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Step 1
Step 2

irradiating the amorphous silicon film with laser light to produce a crystalline silicon film from the amorphous silicon film using the metal element; [and]

subjecting the crystalline silicon film to a heat treatment in a non-oxidizing atmosphere to decrease a spin density in the crystallized silicon film; and

selectively introducing an impurity into the crystalline silicon film.

10. (Twice Amended) The method according to claim 6, wherein the irradiating step is performed while the crystalline silicon film is [heated to] maintained at a temperature of 450 to 600°C.

11. (Twice Amended) A manufacturing method of a semiconductor device, comprising the steps of:

disposing a catalyst element or a compound including the catalyst element in contact with an amorphous silicon film by solution application, wherein said catalyst element or compound including the catalyst element promotes crystallization of the amorphous silicon film,

crystallizing the amorphous silicon film using the catalyst element or compound including the catalyst element by irradiating it with laser light; [and]

subjecting crystallized silicon film to a heat treatment in a non-oxidizing atmosphere to decrease a spin density in the crystallized silicon film; and

selectively introducing an impurity into the crystallized silicon film.

14. (Twice Amended) A manufacturing method of a semiconductor device, comprising the steps of:

applying, to an amorphous silicon film, a solution in which a catalyst element for promoting crystallization of the amorphous silicon film is dissolved or dispersed;

increasing crystallinity of the silicon film using the catalyst element by irradiating the silicon film with laser light; [and]

heating the silicon film in a nitrogen atmosphere in which the crystallinity has been increased; and

patterning the crystallized silicon film into an island after the heating step.

17. (Twice Amended) A manufacturing method of a semiconductor device, comprising the steps of:

applying, to an amorphous silicon film, a polar solvent in which a compound of a catalyst element for promoting crystallization of the amorphous silicon film is dissolved or dispersed;

crystallizing the silicon film using the catalyst element by irradiating it with laser light; [and]

subjecting crystallized silicon film to a heat treatment in a non-oxidizing atmosphere; and

patterning the crystallized silicon film into an island after the heat treatment step.

21. (Twice Amended) A method of manufacturing a semiconductor device, comprising the steps of:

introducing a metal element for promoting crystallization of silicon into an amorphous silicon film by solution application;

irradiating the amorphous silicon film with laser light to crystallize it using the metal element;

subjecting the crystallized silicon film to a heat treatment in a non-oxidizing atmosphere to decrease a spin density in the crystallized silicon film;

selectively introducing an impurity into the crystallized silicon film;
and

repeating the second and third steps two or more times in total.

22. (Twice Amended) A method of manufacturing a plurality of thin-film transistors on a substrate having an insulative surface, comprising the steps of:

forming an amorphous silicon film on the substrate having the insulative surface;

selectively introducing a metal element for promoting crystallization of silicon into the amorphous silicon film [by solution application so that the metal element is brought in contact with a surface of the amorphous silicon film];

crystallizing the amorphous silicon film using the metal element by irradiating it with laser light; [and]

heating the crystallized silicon film in a non-oxidizing atmosphere;
and

patterning the crystallized silicon film into an island after the heating step.